

REMARKS

This reply is filed in response to the office action dated September 23, 2004.

Reconsideration of the application and the claims is respectfully requested. In this reply, claims are being amended to overcome the claim objections. Additional amendments to the claims are made solely to clarify the language of the claims, and not, for example, for patentability reasons. Also in the reply, the specification is being amended for clarification purpose.

Claim Objection

Claims 5, 7, 8, and 27 are amended as suggested in the office action.

Claim Rejections – 35 U.S.C. §112, second paragraph

Claim 27 is being amended to recite "a semiconductor."

Claim Rejections – 35 U.S.C. §102(b), §103(a)

Claims 1-5, 7, 8 and 27-29 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as allegedly being obvious over Lee, U.S. Patent 3,925,235. Applicants respectfully traverse the rejection.

Lee does not disclose, suggest, or teach every element claimed in independent

claim 1. For instance, Lee does not place the "excited species near a conducting surface for electron-jump effect to occur." Rather, Lee appears to disclose only an exothermic charge transfer chemical reaction directly with and on the surface of a semiconductor.

Lee does not disclose, suggest, or teach "a conducting surface." Moreover, it is not clear whether Lee allows "electron-jump effect to occur." For example, "electron-jump" does not require, nor can it make use of, any exothermic charge transfer reactions of any kind.

On the other hand, independent claim 1 recites "placing the excited species near a

conducting surface for electron-jump effect to occur." For at least the foregoing reason, Lee does not disclose, suggest, or teach every element claimed in independent claim 1, and by virtue of their dependencies, claims 2-5, 7, 8, and 27-29.

Claims 1-3, 7, 8, and 27 were rejected under 35 U.S.C.(a) by or, in the alternative, under 35 U.S.C. 103(a) over Nienhaus et al, "Direct detection of electron-hole pairs generated by chemical reactions on metal surfaces." Applicants respectfully traverse the rejection.

Nienhaus et al. does not disclose, suggest, or teach a "method for converting chemical energy into a useful form of energy" including at least "converting an energy of the excited carriers into a useful form of energy" recited in independent claim 1. Rather, Nienhaus et al. shows experimenting with transient short circuit current as a chemical detector method. Short circuits, as known to one skilled in the circuit technology, cannot generate energy because the output energy is the product of voltage, current, and time. The voltage of a short circuit is zero. Nor can Nienhaus et al. generate a useful voltage. To generate a useful voltage the rate of accumulation of charge across the diode must be greater than the leakages of the diode. The Nienhaus et al. accumulation rate is so low compared to leakages that measuring the short circuit current requires operation at 130 Kelvin, or minus 140 Celsius. Further, the Nienhaus et al. detector methods depend on consuming the converting device itself as a reactant. In particular, Nienhaus et al. device ceases to generate short circuit current when the entire topmost layer of metal atoms of the sensor experiment diode has completely reacted chemically with the chemical being adsorbed or chemisorbed on the metal. For example, Nienhaus et al. cites chemisorption of molecular oxygen on silver (Ag). The silver (Ag) is his detector element. When the

oxide forms an Ag-oxide monolayer, short circuit current ceases. Therefore Nienhaus et al.'s device does not "convert an energy of the excited carriers into a useful form of energy" because, for example, it does not function at all after a predictable, short time. Indeed, Nienhaus et al.'s transient current, as implied in the words, terminates within minutes. Accordingly, Nienhaus et al. for at least the foregoing reasons does not disclose, suggest, or teach every element claimed in claim 1. By their dependencies, Nienhaus et al. does not disclose, suggest, or teach dependent claims 2-3, 7, 8, and 27.

Double Patenting

With respect to the double patenting rejection over U.S. Patent 6,678,305, Applicants respectfully submit that the claims in the present application are not obvious over the claims in that patent, for instance, at least because the claims in that patent do not recite the "converting" step recited in claim 1 of the present application. Further, with respect to the double patenting rejection over the co-owned patents, while Applicants do not concede to the propriety of the double patenting rejection in the Office Action, Applicants will submit a terminal disclaimer to obviate the rejections if needed to expedite the application to issue.

With respect to the provisional double patenting rejections over the co-pending co-owned applications, since they are provisional, Applicants respectfully request that the Examiner withdraw these rejections when all other rejections are resolved.

With this reply, new claims 30-46 are being presented. All pending claims are believed to be patentable and a favorable Office Action is hereby earnestly solicited. If a

telephone interview would be of assistance in advancing prosecution of the subject application, the Examiner is requested to telephone the number provided below.

Please charge any fee due associated with this reply to Deposit Account No. 02-0393.

Respectfully submitted,


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